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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/520,080

01/05/2005

Abdoulaye Doucoure

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EXAMINER

MENON, KRISHNAN S

ART UNIT

PAPER NUMBER

1797

MAIL DATE

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10/12/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/520,080	<b>Applicant(s)</b> DOUCOURE ET AL.	
	<b>Examiner</b> Krishnan S. Menon	<b>Art Unit</b> 1797	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 October 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,2,4-30 and 32-34 is/are pending in the application.
- 4a) Of the above claim(s) 19-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-18 and 32-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

Claims 1,2,4-30, 32-34 are pending as amended on 10/2/07, of which claims 19-30 are withdrawn from consideration.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1,2,4-11, 14-18 and 32-34 are rejected under 35 U.S.C. 102(b) as being anticipated by, or in the alternative, under 35 USC 103(a) as being obvious over, Hirose et al (US 5,811,251).

Hirose teaches a microporous PTFE membrane having a checkered pattern of hydrophilic regions through the entire thickness and bulk of the membrane, produced by treatment with UV light after impregnating with hydrophilizing agents – see example 8. The membrane is described as hydrophilic PTFE, but the reference does not specify the CWST as claimed. However, the CWST would be an inherent property of the hydrophilic PTFE membrane (see column 3, lines 49-59), unless applicant can show otherwise with evidence. The claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d, 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). The same is true for the bubble point values – inherent.

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The microporous membrane has pore size range from 0.1-1  $\mu\text{m}$  (column 3, lines 49-59). The membrane would inherently resist dewetting when contacted with hot water. The surface O/C ratio and the extractables should also be inherently as claimed. The membrane is free of any coating. Claims 32 and 33 are intended use of the membrane – see examples.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1,2,4-11, 14-18 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sipsas et al (US 5,198,505); Sirkar, et al (US 5,053,132); Fujimoto, et al (US 5,130,024); Yokoe, et al (US 5,718,957); Kawai et al (US 5,158,680); Kuzowski et al (US 5,437,900); and/or Hirose

These claims recite a microporous PTFE membrane with the following limitations in various combinations:

- first and second surface separated by a thickness
- CWST of at least 40,26,45,58 dynes/cm through the thickness of the membrane
- Wetting/dewetting ratio of at least about 7 for 2 or more cycles

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- At least one surface has F/C ratio of about 1.2 or more (Sipsas has 1.0 or more in PVdF – close enough!)
- Water bubble point of at least about 33 or 45 or 75 psi
- Nominal pore size in the range 0.02-0.1  $\mu\text{m}$
- Halopolymer is a fluoropolymer, or PTFE
- Halopolymer membrane resists dewetting when contacted with hot water
- At least one surface had O/C ratio 0.15 or less
- Less than 100 ppb extractables or 30 or 15 ppb metal extractables

Sipsas teaches a PVdF hydrophilic membrane (abstract). Sipsas does not specify the CWST of the membrane, but it should be inherently above 40 dynes/cm because it is hydrophilic, which means water – wettable, and it should have a CWST approaching 72 dynes/cm, the surface tension of water, to be water-wettable.

Sipsas does not teach PTFE. However, giving the broadest reasonable interpretation of the claims, applicant's claim also recite an F/C ratio of 1.2 or more for the PTFE membrane, which ratio falls within the bounds of F/C ratio for PVdF (which is less than 1.6 – see the reference Yokoe, US 5,718,957 which teaches that PVdF has an F/C ratio less than 1.6), thus making applicant's claimed PTFE material composition overlap the composition of PVdF. Moreover, Sipsas would make the claims obvious because PTFE is expected to behave similarly to PVdF (MPEP 2144.09).

Since the material is a fluorocarbon, it will not have any metal extractable matter.

The water bubble point of at least 75 psi is a characteristic of the pore size and pore size distribution of the hydrophilic membrane. The reference does not say

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anything about the bubble point. However, since the reference teaches a microporous membrane with pore size range 0.01 – 1  $\mu\text{m}$  (column 3, lines 10-27), it would be obvious to one of ordinary skill in the art at the time of invention to have the membrane with the specific bubble point which is hydrophilic as taught by Sipsas.

Sipsas also does not say if the wetting/dewetting ratio is at least about 0.7 for 2 or more cycles. However, the teaching of Sipsas appears to imply that the hydrophilic property developed in the membrane is permanent due to its change in crystallinity – see column 2, lines 41-51. Therefore the ratio should stay about 1 in repeated cycles.

Surface ratio of O/C is less than 0.15, it is in fact 0, since heat treatment only changes crystallinity as shown above. Sipsas does not teach PTFE, but it would be obvious to one of ordinary skill in the art at the time of invention that since PTFE is also a fluoropolymer, it would also become hydrophilic as PVdF by the treatment.

Hydrophilic fluoropolymers, and hydrophilic PTFE are also well known in the art as taught by Sipsas and other references listed. Sirkar teaches at column 4, lines 50-61, that PTFE can be made hydrophilic by treatment with sulfuric acid, chromic acid, strong oxidizing agents or by corona discharge. Fujimoto teaches treating PTFE with perfluoroalkyl sulfonated to make it hydrophilic, and perfluoroalkyl sulfonated would have F/C ratio as claimed. Kawai teaches making PTFE hydrophilic by immersing in alcohols, etc. Kuzowski teaches plasma-treating the PTFE membrane to a short-term exposure (such as less than 5 min – see figure 3) to make it hydrophilic. Hirose teaches making PTFE membrane hydrophilic through the bulk by exposing to UV (see paragraph 1 above).

Claims 32 and 33 are intended use of the membrane, which is also not patentable.

With respect to the newly added claim 34, the PTFE membranes taught by the references are not made with any coating.

### ***Response to Arguments***

Applicant's arguments filed 10/2/07 have been fully considered but they are not persuasive.

Kuzowski: arguments are not commensurate in scope with the rejection – this reference was included with other references to show that hydrophilic PTFE is known in the art. Argument that this reference teaches increasing hydrophobicity is not accurate – only excessive treatment causes increase in hydrophobicity – see figure 3, for example.

Sispas: this reference teaches using known methods of making the membrane hydrophilic after heat-treating, which makes the claims obvious. Moreover, the teaching of the reference imply that heat-treating improves the quality of the hydrophilic membrane, or somehow makes better hydrophilic membrane which imply that heat treatment contributes towards making the membrane hydrophilic.

Yokoe was used to show the F/C ratio of the polymers.

Sirkar teaches using various oxidizing acids, radiation, or ion or corona discharge to make the side hydrophilic. This does not mean that the treatment is only limited to

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the surface, but would extend to the depth of penetration of the reagents or the radiation.

Fujimoto: having a hydrophilic fluoro-polymer in the pores would extend the treatment to the bulk and the thickness, and would not limit it to the surface.

Kawai: immersing in alcohol, etc also would have the treatment to the entire bulk, not limited to the surface.

With respect to the CWST value, applicant needs to show that the teaching of the references would not provide the CWST value claimed. The examiner submits that they are inherent in the hydrophilic membrane.

### ***Allowable Subject Matter***

The independent claims can be made allowable by incorporating the limitation:

"PTFE membrane modified by subjecting to blackbody UV irradiation after impregnating with sodium sulfite"

This process step appears to be providing added structure to the PTFE membrane that makes it hydrophilic, which is not recognized in the prior arts.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'K S Menon', with a stylized, flowing script.

Krishnan S Menon  
Primary Examiner  
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